

What is claimed is:

1. A battery pack comprising:

a rechargeable battery having a first electrode and a second electrode; and

5 a protection device to protect the rechargeable battery when a rechargeable battery abnormality is detected,

wherein the protection device has output terminals including

an externally exposed first output terminal connected to the first electrode of the rechargeable battery,

10 an externally exposed second output terminal connected to the second electrode of the rechargeable battery,

an externally exposed third output terminal for signal detection, and a contact switching section allowing contact to be switched to protect the rechargeable battery when a rechargeable battery abnormality is

15 detected, and

wherein the protection device is the output terminals and contact switching section formed as a single piece, the contact switching section has one end connected to the second electrode of the rechargeable battery, the other end is connected to allow switching between a contact connected to the second output terminal and a contact connected to the third output terminal, when no abnormality is detected the other end is connected to the contact connected to the second output terminal, and when an abnormality is detected the other end switches to the contact connected to the third output terminal.

25 2. A battery pack as recited in claim 1 wherein the third output terminal is connected to a detection device to distinguish the type of the rechargeable battery.

30 3. A battery pack as recited in claim 1 wherein the third output terminal is connected to a detection device to discern rechargeable battery temperature rise.

4. A battery pack as recited in claim 2 wherein the detection device is connected between the third output terminal and the second output terminal.

5. A battery pack as recited in claim 1 wherein a protection element,
5 connected between the second electrode of the rechargeable battery and the second output terminal, is provided as a safety element, housed in the protection device, to protect the rechargeable battery when a rechargeable battery abnormality is detected.

10 6. A battery pack as recited in claim 5 wherein the protection element is a PTC device.

7. A battery pack as recited in claim 4 wherein a protection element,
connected between the second electrode of the rechargeable battery and the
15 second output terminal, is provided as a safety element, housed in the protection device, to protect the rechargeable battery when a rechargeable battery abnormality is detected.

8. A battery pack as recited in claim 7 wherein the protection element is a
20 PTC device.

9. A battery pack as recited in claim 7 wherein the safety element and detection device of the protection device are connected at the surface opposite the externally exposed surface of the output terminals.

25 10. A battery pack as recited in claim 9 wherein the detection device is electrically connected between the second output terminal and the third output terminal by direct attachment to the backside of the exposed output terminal surfaces.

30 11. A battery pack as recited in claim 1 wherein the rechargeable battery and the protection device are molded in synthetic resin to form a single piece.

12. A battery pack as recited in claim 1 wherein the contact switching section is provided by an arm which is activated by bimetal.

13. A battery pack as recited in claim 12 wherein one end of the arm is a fixed end, the other end is a switching end, in its normal position the switching end connects to a contact connected to the second output terminal connecting the arm in parallel with the protection element, the switching end can switch to an abnormal position connected to a contact connected to the third output terminal connecting the third output terminal with the second electrode of the rechargeable battery, when an abnormality due to temperature rise is detected by the bimetal activated arm, it switches from the normal position to the abnormal position, and when the arm ceases to detect an abnormality, it returns to the normal position.

14. A method of detecting battery pack abnormalities, wherein the battery pack is provided with a rechargeable battery that can be charged and a protection device to protect the rechargeable battery when an abnormality is detected, comprising:

A step, when the protection device detects no rechargeable battery abnormality, for the electrical equipment connected with the battery pack to detect a detection device signal from the third output terminal connected to the detection device, which distinguishes the type of the rechargeable battery;

A step, when the protection device detects a rechargeable battery abnormality, to bypass the detection device and connect the second electrode of the rechargeable battery to the third output terminal; and

A step for the electrical equipment to detect abnormality via the third output terminal, and transition to a specified abnormal mode of operation, which can operate at a lower voltage than the specified voltage of the rechargeable battery.

15. A method of detecting battery pack abnormalities as recited in claim 14 wherein the specified abnormal mode of operation is display of a specified display screen.